

REMARKS

The Official Action mailed December 13, 2002, has been received and its contents carefully noted. Filed concurrently herewith is a *Request for One Month Extension of Time*, which extends the shortened statutory period for response to April 14, 2003. Accordingly, the Applicants respectfully submit that this response is being timely filed.

The Applicants note with appreciation the consideration of the Information Disclosure Statements filed on April 5, 2001, and July 10, 2002. However, the Applicants have not received acknowledgment of the IDS filed on August 19, 2002. Please note that the IDS filed August 19 differs from the IDS filed July 10 in that it contains a full English-language translation of the JP '977 reference instead of only an abstract. The Applicants respectfully request that the Examiner provide an initialed copy of the Form PTO-1449 evidencing consideration of this IDS.

Claims 2, 4, 21-24 and 26-42 are pending in the present application, of which claims 2, 4, 30, 34, 37 and 40 are independent. Independent claims 2, 4, 30, 34, 37 and 40 have been amended to better recite the features of the present invention. For the reasons set forth in detail below, these claims are believed to be in condition for allowance.

The Official Action rejects claims 2, 4, 22 and 27 as anticipated by U.S. Patent No. No. 6,008,969 to Oana et al. The Applicants respectfully submit that an anticipation rejection cannot be maintained against the independent claims of the present invention, as amended. Oana does not teach all the elements of the independent claims, either explicitly or inherently. Independent claims 2 and 4, as amended, recite a pair of first semiconductor films of one conductivity type formed on a second conductive film, and a second semiconductor film formed on and extending between the pair of first semiconductor films. Further, independent claim 2 has been amended to recite that each of a first wiring and a second wiring has tapered inner and outer edges (see Fig. 1). Independent claim 4 has also been amended to recite tapered inner and outer edges and is believed to be allowable for similar reasons. Oana does not teach at least these features of the present invention. Since Oana does not teach all the elements of

the independent claims, either explicitly or inherently, an anticipation rejection cannot be maintained.

The Official Action rejects dependent claims 21 and 26 as obvious based on the combination of Oana and U.S. Patent No. 5,917,564 to Kim et al. The Applicants respectfully submit that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present invention, as amended.

As stated in MPEP §§ 2143-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. Kim '564 does not cure the deficiencies in Oana. The Official Action relies on Kim '564 to teach a semiconductor device comprising a second conductive layer of aluminum (p. 3, ¶3, Paper No. 13). Oana and Kim '564, either alone or in combination, do not teach or disclose a pair of first semiconductor films of one conductivity type formed on a second conductive film, a second semiconductor film formed on and extending between the pair of first semiconductor films, and tapered inner and outer edges. Since Oana and Kim '564 do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot

be maintained. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) is in order and respectfully requested.

The Official Action rejects dependent claims 23, 24, 28 and 29 as obvious based on the combination of Oana and U.S. Patent No. 6,100,954 to Kim. Kim '954 does not cure the deficiencies in Oana. The Official Action relies on Kim '954 to teach a gate electrode comprising at least one element selected from the group consisting of Al, Cr, Ta, Ti, W and an alloy containing the element (Id. at ¶5). Oana and Kim '954, either alone or in combination, do not teach or disclose a pair of first semiconductor films of one conductivity type formed on a second conductive film, a second semiconductor film formed on and extending between the pair of first semiconductor films, and tapered inner and outer edges. Since Oana and Kim '954 do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) is in order and respectfully requested.

The Official Action rejects claims 2, 4, 22-24, 27-31, 33-35, 37, 38, 40 and 41 as obvious based on the combination of U.S. Patent No. 6,285,041 to Noguchi in view of U.S. Patent No. 5,528,082 to Ho et al. and Kim '954. As noted above, independent claims 2 and 4, as amended, recite a pair of first semiconductor films of one conductivity type formed on a second conductive film, a second semiconductor film formed on and extending between the pair of first semiconductor films, and that each of a first wiring and a second wiring has tapered inner and outer edges (see Fig. 1). Independent claims 4, 30, 34, 37 and 40 have also been amended to recite tapered inner and outer edges and are believed to be allowable for similar reasons. Noguchi, Ho and Kim '954, either alone or in combination, do not teach or disclose at least the above-referenced features of the present invention. Since Noguchi, Ho and Kim '954 do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.


The Official Action rejects dependent claims 21 and 26 as obvious based on the combination of Noguchi, Ho, Kim '954 and Kim '564. Kim '564 does not cure the deficiencies in Noguchi, Ho and Kim '954. As noted above, the Official Action relies on Kim '564 to teach a semiconductor device comprising a second conductive layer of

aluminum (p. 8, ¶1, Paper No. 13). Noguchi, Ho, Kim '954 and Kim '564, either alone or in combination, do not teach or disclose at least the above-referenced features of the present invention. Since Noguchi, Ho, Kim '954 and Kim '564 do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) is in order and respectfully requested.

The Official Action rejects dependent claims 32, 36, 39, and 42 as obvious based on the combination of Noguchi, Ho, Kim '954 and Oana. Oana does not cure the deficiencies in Noguchi, Ho and Kim '954. The Official Action relies on Oana to teach a pair of barrier metal layers formed of Ti or Ta (Id. at ¶3). Noguchi, Ho, Kim '954 and Oana, either alone or in combination, do not teach or disclose at least the above-referenced features of the present invention. Since Noguchi, Ho, Kim '954 and Oana do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) is in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend the claims as follows:

2. (Amended) A semiconductor device comprising:

a first wiring and a second wiring formed of a first conductive film on an insulating surface;

a second conductive film formed on the first and second wirings so as to correspond thereto;

a pair of first semiconductor films of one conductivity type formed on the second conductive film;

a second semiconductor film formed on [an upper layer of the first semiconductor film across the first wiring and the second wiring] and extending between the pair of first semiconductor films;

an insulating film formed on the second semiconductor film; and

a third conductive film formed on the insulating film,

wherein an end portion of the second semiconductor film is provided inside an end portion of the second conductive film[.], and

wherein each of the first wiring and the second wiring has tapered inner and outer edges.

4. (Amended) A semiconductor device comprising:

a data wiring and a pixel electrode formed on an insulating surface;

barrier metal formed so as to correspond to the data wiring and the pixel electrode;

a pair of first semiconductor films of one conductivity type formed on the barrier metal;

a second semiconductor film formed on [an upper layer of the first semiconductor film across the data wiring and the pixel electrode] and extending between the pair of first semiconductor films;

a gate insulating film formed on the second semiconductor film; and

a gate electrode formed on the gate insulating film,

wherein an end portion of the second semiconductor film is provided inside an end portion of the barrier metal[.] and

wherein each of the data wiring and the pixel electrode has tapered inner and outer edges.

30. (Amended) A semiconductor device comprising:

at least first and second conductive films formed on an insulating surface wherein the first and second conductive films are separated from each other;

a pair of first semiconductor films of one conductivity type formed over the first and second conductive films;

a second semiconductor film formed on and extending between the pair of first semiconductor films;

an insulating film including a gate insulating film formed on the second semiconductor film; and

a third conductive film including a gate electrode formed on the insulating film,

wherein each of the first and second conductive films and the pair of first semiconductor films has [a] tapered inner and outer edges.

34. (Amended) A semiconductor device comprising:

at least first and second conductive films formed on an insulating surface wherein the first and second conductive films are separated from each other;

a pair of first semiconductor films of one conductivity type formed over the first and second conductive films;

a second semiconductor film formed on and extending between the pair of first semiconductor films;

an insulating film including a gate insulating film formed on the second semiconductor film; and

a third conductive film including a gate electrode formed on the insulating film,

wherein each of the pair of first semiconductor films and the second semiconductor film has [a] tapered inner and outer edges and the pair of first semiconductor films extend beyond side edges of the second semiconductor film.

37. (Amended) A semiconductor device comprising:

at least first and second conductive films formed on an insulating surface wherein the first and second conductive films are separated from each other;

a pair of first semiconductor films of one conductivity type formed over the first and second conductive films;

a second semiconductor film formed on and extending between the pair of first semiconductor films;

an insulating film including a gate insulating film formed on the second semiconductor film; and

a third conductive film including a gate electrode formed on the insulating film,

wherein each of the second semiconductor film and the third conductive film has [a] tapered inner and outer edges and the second semiconductor film extends beyond side edges of the third conductive film.

40. (Amended) A semiconductor device comprising:

at least first and second conductive films formed on an insulating surface wherein the first and second conductive films are separated from each other;

a pair of barrier metal layers formed on the first and second conductive films wherein said barrier metal layers have a tapered outer edge;

a pair of first semiconductor films of one conductivity type formed on the pair of barrier metal layers, respectively, wherein each of the first semiconductor films has a tapered outer edge;

a second semiconductor film formed on and extending between the pair of first semiconductor films wherein the second semiconductor film has a tapered outer edge;

an insulating film including a gate insulating film formed on the second semiconductor film; and

a third conductive film including a gate electrode formed on the insulating film wherein said third conductive film has a tapered outer edge,

wherein said insulating film extends beyond the outer edge of the third conductive film, and said second semiconductor film extends beyond an outer edge of the insulating film[.],

wherein each of the first conductive film and the second conductive film has tapered inner and outer edges.